Welcome to Clean Energy Virginia Webinar Series

Today's Topic: Energy Storage

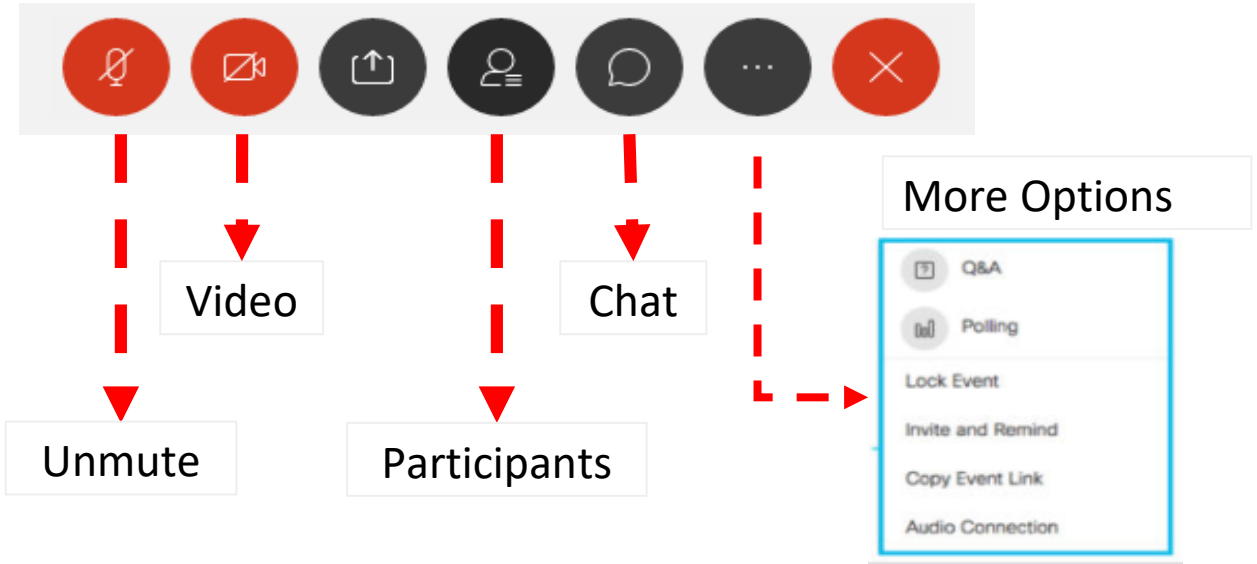
We will begin in a few minutes

Housekeeping Rules

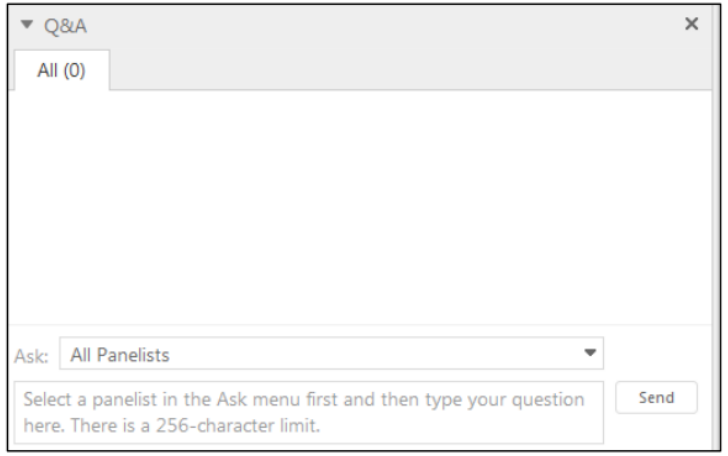
- Please mute your mic
- Please use the Q&A box to ask your questions
- We will hold a moderated Q&A session at the end of the presentation
- Any unanswered questions will be answered by the team during the coming week.

Submit Questions in Q&A on Right Panel

Navigation radials at the bottom of your WebEx Screen:



Q&A Panel on the right:



Clean Energy Virginia Webinar Series

Angela Navarro
Deputy Secretary of Commerce and Trade
Office of Governor Northam

July - August 2020

Webinar Topics

Webinars will discuss the Commonwealth's clean energy policies and next steps, with a focus on the following subjects:

- Webinar 1: July 22, 2020 Energy Efficiency
- Webinar 2: July 29, 2020 Distributed Generation Solar
- **Webinar 3: August 5, 2020 Energy Storage**
- Webinar 4: August 12, 2020 Utility Scale Solar and Onshore Wind
- Webinar 5: August 19, 2020 Offshore Wind

Register Today: https://www.dmme.virginia.gov

Storage Presentation Outline

- **Virginia Policy Begins to Focus on Supporting Energy Storage**
  Cliona Robb, Thompson McMullan
- **Energy Storage Requirements of the VCEA**
  Jason Burwen, Energy Storage Association
- **State Corporation VCEA Requirements and Updates**
  Arlen Bolstad, Virginia State Corporation Commission
- **Virginia Energy Storage Opportunities**
  Ed Burgess, Strategen Consulting
- **Virginia Energy Storage Case Study**
  Richard Russell, East Point Energy
- **Virginia Advantages**
  Tommy Miller, Virginia Economic Development Partnership
- **Q&A**

Clean Energy Virginia Policy Objectives

- Transition Virginia's electric grid to 100% carbon-free resources by 2050
- Significant build-out of clean energy assets that will drive new investment across the Commonwealth
- Provide the landscape for clean energy businesses to expand or locate in the Commonwealth
- Ensure energy equity and environmental justice while providing benefits to historically economically disadvantaged communities

State Energy Goals: Executive Order 43

30% by 2030

Produce 30 percent of Virginia's electricity from renewable energy sources by 2030

100% by 2050

Produce 100 percent of Virginia's electricity from carbon-free sources by 2050

Energy Equity

Achieve energy goals in a just manner that advance social, energy, and environmental equity

Virginia Clean Economy Act

- **Establishes a mandatory renewable portfolio standard (RPS):**

  Dominion Energy: 40% by 2030; 100% by 2045
  Appalachian Power: 30% by 2030; 100% by 2050

- **Establishes a mandatory energy efficiency resource standard (EERS):**

  Dominion Energy: 5% by 2025
  Appalachian Power: 2% by 2025

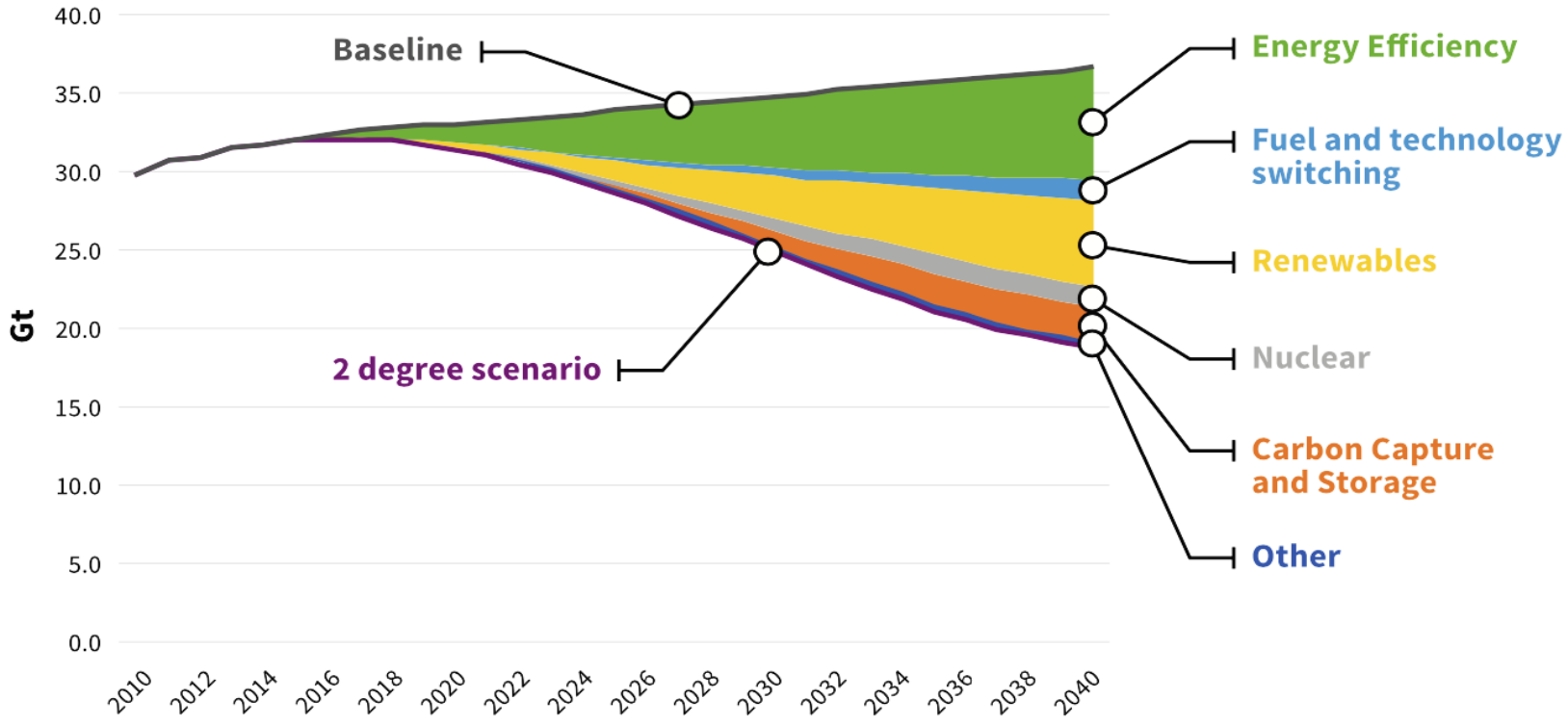
- **Deems 16,100 MW of solar and onshore wind, 5,200 MW of offshore wind, and 2,700 MW of energy storage in the public interest.**

VCEA – Major Regulatory Changes

- Requires State Corporation Commission (SCC) to consider the ***social cost of carbon*** in any application to construct new generating facility
- The SCC must ensure development of new energy resources or facilities does not have disproportionate adverse impact on **historically economically disadvantaged communities** (**HEDCs**)
- Establishes a **Percentage of Income Payment Program** (**PIPP**) for low-income households to provide an alternative payment structure

A Look At Our Carbon-Free Future

Figure 4. IEA *Global Energy Outlook* emissions scenario with temperature increase limited to 2 degrees



Source: ACEEE graph using data from International Energy Agency (IEA). www.aceee.org/sites/default/files/publications/researchreports/u1604.pdf

Worker Health & Safety During COVID-19 Pandemic

- Virginia Department of Labor and Industry's Safety and Health Codes Board adopted the first statewide emergency workplace safety standards in the U.S. in response to COVID-19
- These standards mandate appropriate personal protective equipment, sanitation, social distancing, infectious disease preparedness and response plans, record keeping, training, and hazard communications in workplaces across the Commonwealth.
- Opportunities to innovate new processes and technologies to protect health and safety

Audience Poll Question

What type of organization do you represent?

(Please respond using poll in side panel)

Energy Storage
and the
Virginia Clean Economy Act

STRATEGEN CONSULTING

ESA Energy Storage Association

Thompson McMullan P.C. A PROFESSIONAL CORPORATION

EAST POINT ENERGY

VIRGINIA ADVANCED ENERGY ECONOMY

VEDP Virginia Economic Development Partnership

SCC Commonwealth of Virginia State Corporation Commission

DMME Virginia Department of Mines Minerals and Energy

CLEAN ENERGY VIRGINIA

Evolution of Energy Storage Policy in Virginia

Cliona Robb

Director, Thompson McMullan

Chair of the Virginia Solar Energy Development and Energy Storage Authority

Virginia Solar Energy Development and Energy Storage Authority

- In 2017, energy storage was added as a key activity for the VSEDESA
- In 2018, VSEDESA sought funding for an energy storage study that was issued in August 2019
- Serves as a sounding board for industry issues, ideas and needs to help support their growth
- Provides different perspectives on recommendations to policy makers for removal of barriers to utility scale and distributed storage technologies

Virginia Solar Energy Development and Energy Storage Authority Members

Cliona Mary Robb
Thompson McMullan
Chair

Will Gathright
Founder
Tumalow, Inc.
Vice Chair

Katharine Bond
Director of Public Policy
Dominion Energy

Paul Duncan
MPR Associates

Damian Pitt
Associate Professor
VCU L. Douglas Wilder School of Gov't & Public Affairs

B. Hayes Framme
Government Relations and Communications Mgr.
Orsted

John Ockerman
CEO
Ockerman Automation Consulting, Inc.

Colleen A. Lueken
Director of Market Analytics
Fluence – AES Energy Storage

Jon F. Hillis
CEO
SolUnesco

John H. Rust, Jr.
Commissioner
CoA-FFX

Careth Cody Nystrom
Managing Director
SJF Ventures

Kenneth G. Hutcheson
Old Dominion Public Affairs

Michael Herbert
Co-Founder/Managing Partner
Delorean Power

Brian M. Gordon
Vice President, Government Affairs
Apartment and Office Building Association

Southwest Virginia Energy Research and Development Authority

- HB 2747 during 2019 General Assembly Session
- Promote opportunities for energy development to create jobs and economic activity in Southwest
- Position Southwest Virginia and the Commonwealth as a leader in energy workforce and technology research and development
- **Supports the development of pumped storage hydro, and energy storage generally in SW Virginia**

Southwest Virginia Energy Research and Development Authority Members

Dr. Michael Karmis
Director
Virginia Center for Coal & Energy Research

Brad Kreps
Director, Clinch Valley Program
The Nature Conservancy

Lydia Sinemus
Corporate Director, Human Resources & Environmental Health and Safety
Strongwell

Michael J. Quillen
Former Chairman/Founder, Alpha Natural Resources Inc

Dr. Kristen A. Westover
President Mountain Empire Community College

J. Jasen Eige
Vice President & General Counsel
The United Company

Duane Miller
Executive Director
LENOWISCO Planning District Commission

Dan Poteet
Former Senior Business Development Manager, Dominion Energy

Steven Breeding
Vice Chairman
Russell County Board of Supervisors

Travis Hackworth
Chairman
Tazewell County Board of Supervisors

Dr. Marcy Hernick
Assistant Dean of Academic Affairs & Assessment
Appalachian College of Pharmacy

Current Energy Storage in Virginia

Dominion

3,000 MW Bath County Pumped Storage Hydro

Largest in the World

Current Energy Storage in Virginia

Appalachian Power

636 MW Smith Mountain Lake

Pumped Storage Hydro

4 MW Byllesby-Buck Hybrid
Hydro Plus Storage Facility

Virginia Energy Storage Projects in the PJM New Services Queue:

- **59 Projects Total = 6,482 MW**
- **30 are Solar + Storage = 3,452 MW**

Grid Transformation and Security Act of 2018

- Dominion Energy Authorized to petition the SCC for approval of one or more **pumped hydro generation and storage facilities in Southwest Virginia**
- Established an **Energy Storage Pilot Program**
  - Appalachian Power – 10 MW
  - Dominion Energy – 30 MW
    - First 16 MW approved by the SCC

Governor Northam's Executive Order 43

September 16, 2019

- Calls for **grid integration** of storage **and pairing with renewable generation**, including distributed energy resources like rooftop solar

Energy Storage Requirements of the Virginia Clean Economy Act

Jason Burwen

Vice President, Policy

Energy Storage Association

VCEA Provisions on the Energy Storage Target

- **Top-line VCEA provisions for energy storage**
  - 3,100 MW storage *procurement mandate* by end of 2035
    - 2700 MW found to be **"In the public interest"**
  - Maximum 500 MW from single storage project can count toward mandate
    - Exception for one 800 MW project – pumped hydro project in development
  - At least 35% of storage MW must be procured from third parties
  - *Goal* of 10% MW behind-the-meter storage
  - SCC implementing regulations required by Jan 1, 2021
    - Case No. PUR-2020-00120 established rulemaking proceeding

VCEA Provisions on the Energy Storage Target

- **SCC implementing regulations required by Jan 1, 2021**
  - Case No. PUR-2020-00120 established rulemaking proceeding
  - Parties filed comments on 7/29
  - Deadline for proposed regulations extended by SCC to 8/14

ESA recommendations on VCEA storage target implementation

- **Interim Targets**
  - APCO target: 100 MWx2022 & 200 MWx2025
  - DOM target: 400 MWx2023 & 900 MWx2026
  - Determine further targets in 2025 (APCo) and 2026 (DOM) after IRPs are filed
  - RFPs concluded 2 years prior to interim target
  - Directed solicitation if target missed
  - Targets include interconnection diversity (incl. 10% BTM target)
  - Targets include requirement of 35+% from 3rd parties

ESA recommendations on VCEA storage target implementation

- **IRP Reforms**
  - Up-to-date cost data, sub-hourly modeling, flexibility needs quantified, demand resources as supply option
- **Procurement Reforms**
  - Storage-specific solicitations preferable for interim targets
  - Update bid evaluation & benefit-cost method for storage
  - Move to all-source RFPs once system needs analysis & RFP processes updated
  - Ensure hybrids and VPPs can bid and be evaluated
  - Provide long-term contracts

Key Business Process Issues Outside of VCEA or SCC Docket

- **Interconnection**
  - **Challenges**
    - Rules have to date not taken into account specific considerations for BTM or FTM distribution-connected energy storage
      - Interconnection updates ordered by SCC on 7/29 in PUR-2018-00107; does not appear to take into account controllability of storage for interconnection service requests
    - Lack of information about interconnection queue time, costs
  - **Solutions**
    - Other states have recently updated regulations for interconnection of storage that account for its controllability – see Maryland, Nevada, etc.
    - Model interconnection practices and regulations being developed by U.S. DOE with Interstate Renewable Energy Council (IREC), Electric Power Research Institute (EPRI), ESA and others

Key Business Process Issues Outside of VCEA or SCC Docket

- **Permitting**
  - **Challenges**
    - Authorities Having Jurisdiction (AHJ) have not yet developed guidance for and may not have experience with energy storage equipment & facilities
    - Recent utility RFPs diverge significantly from codes on storage spacing
  - **Solutions**
    - Existing codes & standards can inform AHJ practice
    - Virginia state agencies can promulgate model codes for local adoption

Virginia State Corporation Commission:
VA Clean Economy Act Requirements and Updates

Arlen Bolstad

Deputy General Counsel (Utilities)

VA State Corporation Commission

Virginia State Corporation Commission: Energy Storage

- Commission Rulemaking re: Energy Storage
- HB 1183 - Bulk energy storage resources
- Small Generator Interconnection (SGI) Rules
- Battery Storage Pilot

Commission Rulemaking re: Energy Storage

- VCEA establishes energy storage targets in § 56-585.5 E (construct or acquire)
- DEV (2700 MW) and APCo (400 MW) by 2035
- At least 35 percent of facilities or their capacity to be purchased from non-utilities.
- Commission directed by § 56-585.5 E 5 to adopt regulations by January 1, 2021.
  - Set interim deployment targets
  - Update planning and procurement rules.
  - Address: programs and mechanisms to deploy energy storage, including competitive solicitations, behind-the-meter incentives, non-wires alternatives, and peak demand reduction programs.

Commission Rulemaking re: Energy Storage

- Commission 6/29/20 Order in Case No. PUR-2020-00120 established rulemaking proceeding.
- APCo and DEV and interested parties to file by July 29, 2020 responses to questions concerning this rulemaking.
- Question topics include: (i) interim targets for acquisition or construction, (ii) competitive solicitation, (iii) applicability of rules to non-utility-owned storage, and (iv) acquisition of facilities or purchases of capacity from utility affiliates.

Commission Rulemaking re: Energy Storage

- APCo and DEV and interested parties may submit proposed regulation for Commission's consideration by 8/14/20.
- Comments received are available on the Commission's website.
- Next step: draft rules will be developed and put out for comment.

HB 1183 - Bulk energy storage resources

- SCC directed by HB 1183 to establish task force to “evaluate and analyze the regulatory, market, and local barriers to the deployment of distribution and transmission-connected bulk energy storage resources.
- Task force membership will include representatives of energy storage providers & associations, utilities, utility customers, competitive service providers Virginia Solar Energy Development and Energy Storage Authority, the Department of Mines, Minerals and Energy, the Office of the Attorney General.
- SCC to submit a copy of the task force's evaluation and analysis to the General Assembly no later than October 1, 2021. SCC likely to organize this task force later this year.

HB 1183 - Bulk energy storage resources

- Task force goals:
  - Help integrate renewable energy into the electrical grid,
  - Reduce costs for the electricity system,
  - Allow customers to deploy storage technologies to reduce their energy costs,
  - Allow customers to participate in electricity markets for energy, capacity, and ancillary services.”
- Task force directed to (i) assess the potential costs and benefits, including impacts to the transmission and distribution systems, of such energy storage resources, and (ii) assess how electric utilities, competitive service providers, customers, and other third parties are able to deploy energy storage resources in the bulk market, in the utility system, and in behind-the-meter applications.

Small Generator Interconnection (SGI) Rules

- Administrative Rule 20VAC5-314 is applicable to small electrical generators and storage interconnecting to distribution.
- The rulemaking was initiated in 2009 in accordance with § 56-578 C of the Code of Virginia.
- Latest Rulemaking Order on July 29, 2020 and goes into effect on October 15, 2020. (Case No. PUR-2018-00107)

Small Generator Interconnection (SGI) Rules

- 2020 SGI Rule Update Goals
  - Update to recent guidelines and standards
  - Address concerns from Utilities and Developers
- Notable Changes
  - Removal of 20 MW upper limit
  - Added new study forms
  - Better defined process timelines to ensure projects do not linger in the queue
  - Projects interdependent with one earlier queued project have the option of beginning the study process earlier
  - Study Deposits, if applicable, are paid upfront when the study process begins

SGI Rules *(effective 10/2020)

Request Level	Capacity Limit*	Fee / Deposit*	Comments
Level 1	≤ 500 kW	$100 processing fee	• Quickest process. • Requires at most only minor modifications to utility's system. • May be escalated to Level 2 or 3.
Level 2	≤ 2 MW	$1,000 processing fee	• Longer process than Level 1. • Requires more modifications to utility's system. • May be escalated to Level 3 if it fails utility's initial screening tests or supplemental reviews.
Level 3	> 2 MW	$1,000 processing fee $10,000 plus $1.00 per kWAC deposit	• Longest interconnection process. • Requires most modifications to utility's system. • Studies performed: Feasibility, System Impact, and Facilities study. • Studies may be performed consecutively or rolled into combined studies by mutual agreement.

Battery Storage Pilot

- Virginia Code § 56-585.1:6
  - APCo – up to 10 MW in capacity
  - Dominion – up to 30 MW in capacity

- Solutions must either:
  - Improve reliability of electrical transmission or distribution systems.
  - Improve integration of different types of renewable resources.
  - Deferred investment in generation, transmission, or distribution of electricity
  - Reduced need for additional generation of electricity during times of peak demand
  - Connection to the facilities of a customer receiving generation, transmission, and distribution service from the utility

Battery Storage Pilot

- Dominion's Battery Storage Pilot (PUR-2019-00124)

Projects	Capacity / Cost	Goal
BESS-1	2 MW / 4 MWh $2.9 million	Study the prevention of solar back-feeding onto the transmission grid. (Dec 2020 in-service)
BESS-2	2 MW / 4 MWh $4.1 million	Study batteries as a non-wires alternative to reduce transformer loading. (Dec 2020 in-service)
BESS-3	2 MW / 8 MWh (DC) 10 MW / 40 MWh (AC) $26.1 million	Study solar plus storage at the Scott Solar Facility. (Dec 2020 in-service)

SCC Staff Contact

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mike.cizenski@scc.virginia.gov

Virginia Energy Storage Opportunities

Ed Burgess

Senior Director

Strategen Consulting

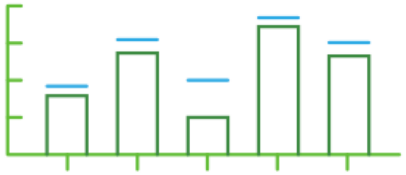
Strategen is a mission-driven professional services firm dedicated to decarbonizing energy systems

CLIENTS

We work with governments, utilities, research institutions, technology providers, project developers, and large energy users seeking to evaluate and implement next generation grid and clean energy technologies.

MARKETS

Our exclusive focus on clean energy and advanced grid technologies means we bring our clients a sophisticated understanding of industry trends, market drivers and regulatory policy.



SERVICES

Our clients come to us for our expertise in developing business models, commercial strategies, financing tools and regulatory support that empower them to create sustainable value and long-term solutions.

TEAM

Our team is comprised of well-respected thought leaders and industry experts who have played instrumental roles in shaping the power sector's transformation in the 21st century.

ESS can provide 13 services to different stakeholders

Customer Services

Increased PV Self-Consumption

Energy Arbitrage

Backup Power

Spin / Non-spin Reserve

Demand Charge Reduction

Voltage Support

Services not possible

Frequency Regulation

Time-of Use Bill Mngmnt.

Black Start

Distribution Deferral

Resource Adequacy

Transmission Deferral

Transmission Congestion Relief

Utility Services

Wholesale Market Services

Centralized

Transmisssion

Distribution

Behind-the-meter

Distributed

Source: Rocky Mountain Institute

Potential Use Cases for Storage in Virginia

1.	Commercial customer **bill management**	Large Commercial & Industrial customers can use to reduce peak demand and improve power quality.
2.	Co-located with new renewable energy resources	CEV established 100% RE requirements for Dominion and APCo. Storage paired w/ RE can benefit from federal ITC.
3.	Peaker Plant Alternative	Storage could be a full or partial replacement for planned new peaking power plants.
4.	Distribution connected (standalone, utility-owned or contracted)	Can be targeted to avoid distribution system upgrades in high load growth areas.
5.	Microgrids for Resiliency & Critical Facilities	Provide system with resiliency and other support services, especially for emergency conditions at critical facilities.
6.	Merchant Wholesale (standalone)	PJM has had a large market for stand-alone merchant ES projects driven by favorable Regulation pricing.
7.	Competitive Service Providers	Load-serving entities that purchase energy from wholesale markets can compete to serve retail loads.

Strategen Analysis on Grid Benefits of Energy Storage in VA

		1hr	2hrs	4hrs	10hrs
		2019			
Low Cost	Efficient Storage Level (MW)	131	137	95	18
	Annual Net Benefits ($M)	$ 5.81	$ 10.84	$ 9.09	$ 0.43
High Cost	Efficient Storage Level (MW)	80	82	43	0
	Annual Net Benefits ($M)	$ 4.05	$ 7.72	$ 4.54	$ -
		2029			
Low Cost	Efficient Storage Level (MW)	1,240	1,123	990	369
	Annual Net Benefits ($M)	$ 34.04	$ 67.21	$ 76.57	$ 42.46
High Cost	Efficient Storage Level (MW)	436	453	370	131
	Annual Net Benefits ($M)	$ 23.29	$ 44.22	$ 36.50	$ 4.93

Over next decade, VA storage potential (<=4 hrs.) ranges from ~400-1200 MW (depending on cost) with net benefits ranging from $23-77 million annually

Comparison of State Energy Storage Policies

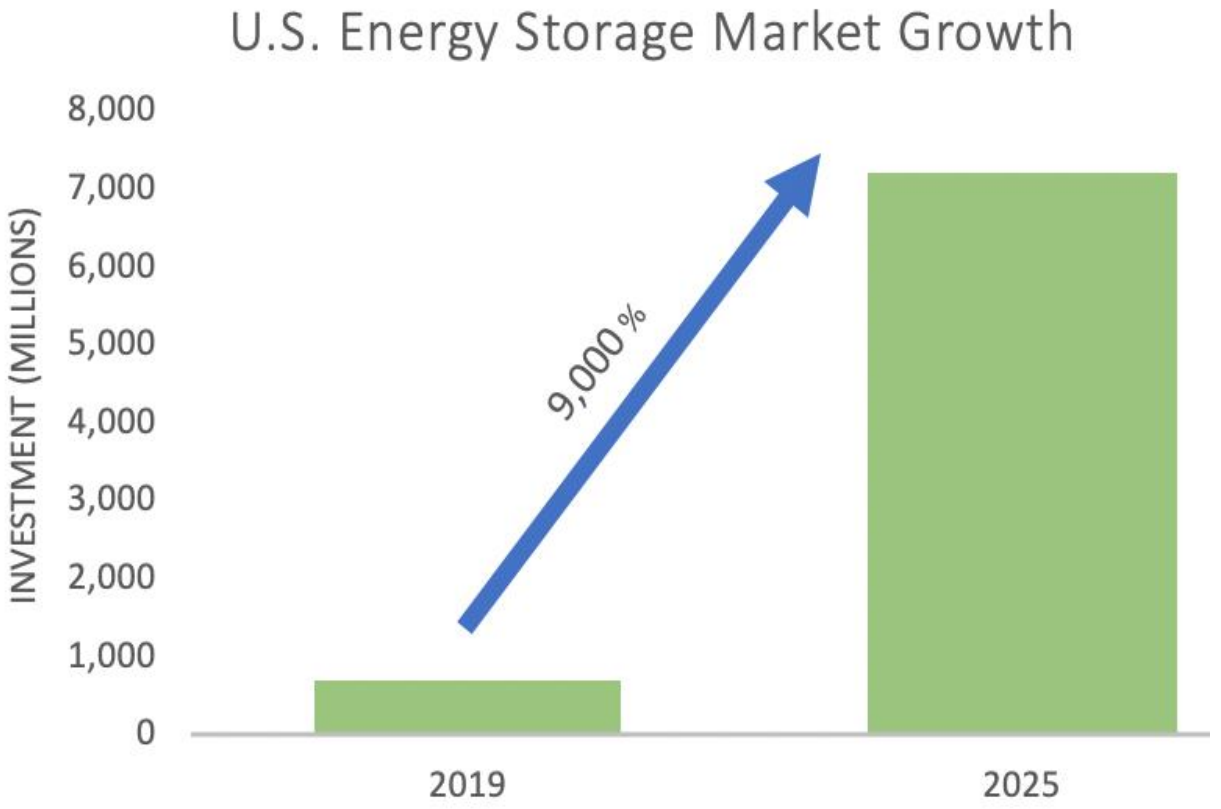
State	Goal/Target/Mandate
California	1,825 MW by 2020 (Requirement)
Nevada	1,000 MW by 2030 (Requirement)
Massachusetts	1,000 MWh by 2025 (Requirement)
New Jersey	2,000 MW by 2030 (Goal)
New York	3,000 MW by 2030 (Requirement)
Oregon	Minimum 5 MWh, up to 1% peak load by 2020 (Requirement)
Virginia	**3,100 MW by 2035 (Requirement)**

Source: Energy Storage Association

- Seven US states have policies that emphasize the role that energy storage will play in their future energy system
- **Virginia currently has the largest energy storage procurement mandate in the US**

Virginia's Economic Opportunity

- The U.S. energy storage market is expected to expand from $712 million in investments in 2019 to $7.2 billion by 2025.
  - Policy plays an important function in determining where in U.S. new investment will go.
- Notably, Virginia has implemented a storage requirement rather than a goal.
  - Setting legally binding requirement ensures developers will have confidence they need to make investments.
  - This presents a long-term policy signal for storage companies to invest in the growing VA market.



Data source: U.S. Energy Storage Monitor

Developing Rules and Regulations to Maximize Benefits of Storage

	Phase 1: Starting	Phase 2: Scaling	Phase 3: Standardizing
PLANNING	✓ Establish energy storage targets	• Enhance resource modelling practices for	• Embrace a integrated grid planning approach
COMPENSATION	• Update retail rate structures to send appropriate price signals	• Open up power markets for energy storage participation	• Move toward a technology-neutral grid services framework
PROCUREMENT	• Open, fair and transparent procurement processes	• Use competitive solicitations (e.g. reverse auctions) to drive down costs, while scaling up	• Implement an “all-source” procurement approach
INTEGRATION	• Modify interconnection rules to define and permit energy storage	• Examine non-wires alternatives and hybrid solutions	• Integrating customer-sited and aggregated energy storage resources

CEV Implementation Ideas and Best Practices

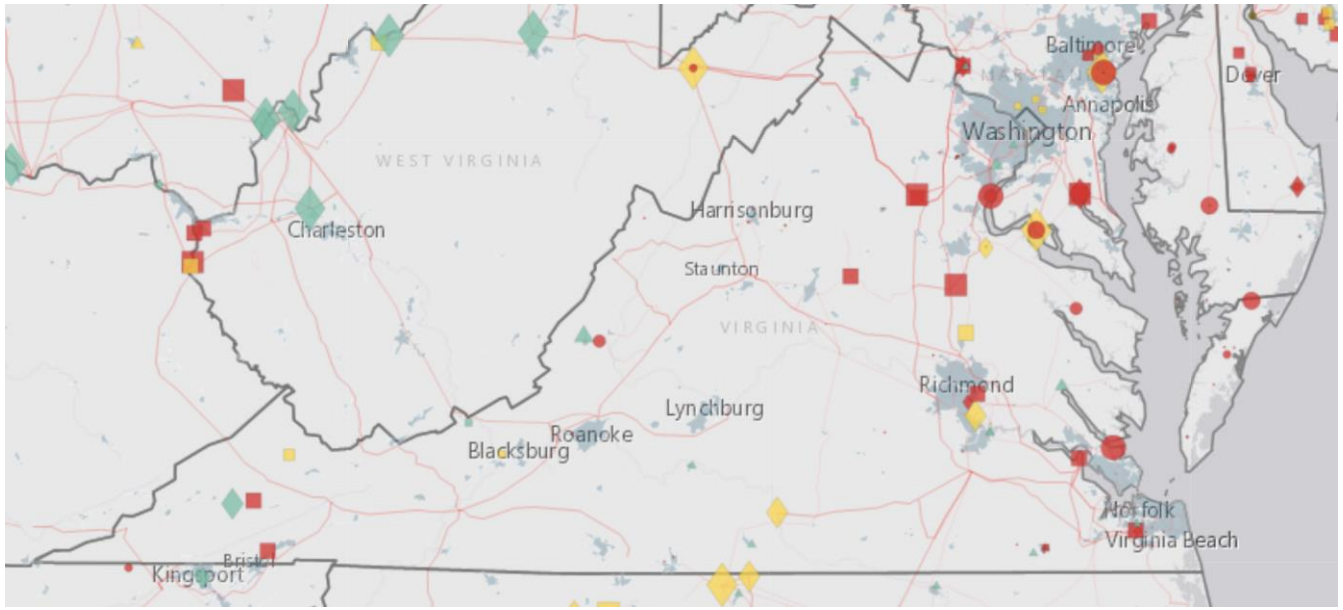
- Establish metrics to ensure storage deployment is aligned with policy goals
  - Example metrics: peak demand reduction (resource adequacy), customer bill savings, GHG reduction
  - Cautionary tale: California's Self Generation Incentive Program
    - Successfully deployed over 100 MW of BTM storage in last 5 years and has aided in transforming the market for energy storage.
    - Has lagged in performance for key policy goals (e.g. GHG, cost-benefit, etc.).
    - Evaluation of metrics has led to key program reforms to enhance performance.
- Conduct competitive solicitations with long enough contract terms to attract investment
- Leverage hybrid resource opportunities: bundle storage with RE procurement; add storage to existing generators to enhance performance & reduce emissions
- Establish "bridge incentives" that phase out over time as a means to accelerate cost reductions and grow market transformation
- Establish a "clean capacity" planning requirement for utilities
- Consider ways to leverage or enhance existing forms of storage:
  - Water heaters as thermal storage

Potential Equity and Environmental Justice Benefits

Possible focus areas as rules and regulations are developed:

- Incentive budgets w/ equity carveouts for disadvantaged communities (DACs).
- RFPs that include preferential scoring for minority owned businesses.
- Direct microgrid/resiliency investment in DACs.
- Peaker plant replacement / hybridization to alleviate pollution burden
- EVs with VGI capability as storage. (e.g. trucks, transit buses), both as direct investment & to alleviate pollution burden.

Fossil fueled Peaker plants in Virginia (red)



East Point Energy Storage Case Study

Rich Russell

Project Developer

East Point Energy

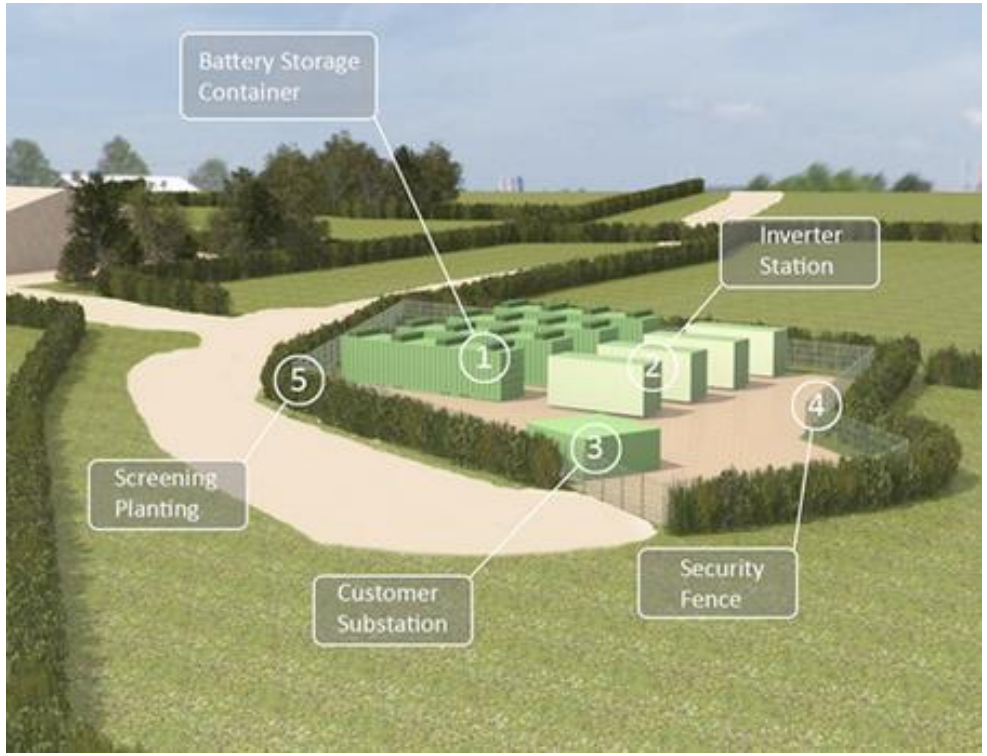
East Point Energy Storage Case Study

- **Introduction to East Point**
  - Energy storage project developer based in Charlottesville, VA
  - Founded by executives with over decade of DER development experience and 1.5 GW's operating nationally
  - Focus on grid-scale battery storage systems
  - Partner with utilities, landowners, and communities to deploy grid-scale projects that make the grid more renewable, resilient, and affordable

EAST POINT ENERGY

Use Cases: Coop Project Example

- East Point is the developer for the first grid-scale energy storage project by a VA eclectic coop (press release coming soon…)
- COD Q1 2021 (expected)
- Values:
  1. Peak shifting – T-demand charge reduction
  2. Deferral of substation upgrades (2 transformers)
  3. Resiliency – project will “island” in an outage and carry a distribution circuit for 4-8 hours
  4. Education – will provide real data to coop and its members to learn how to deploy future projects, reliably, safely, and cost-effectively
- Battery storage is the “bacon” of the grid
  - Project will be integrated with the electrical grid to help enhance electricity reliability



Project Development Issues

- **Federal**
  - PJM capacity value for energy storage 10-hours, but expected to be reduced. Impacts how batteries compete with other technologies
- **State issues**
  - Ambiguity around SCC jurisdiction of energy storage projects. Being explored in SCC docket PUR-2020-00120
  - Ambiguity around taxation of an energy storage systems above 25MW

Project Development Issues

- **Issues at the Local Level**
  - Most ordinances do not address energy storage
    - Similar to the early days of solar
    - Fire Safety Concerns – addressed by NFPA 855 and UL 9540
    - Education about battery storage

An aerial view of a battery storage project at Lee-DeKalb Substation and wind site in Shabbona, Illinois (Photo: NextEra)

Virginia's Advantages

Tommy Miller

Manager, Business Investment

Virginia Economic Development Partnership

VIRGINIA OFFERS A STABLE AND DURABLE PARTNERSHIP IN UNCERTAIN TIMES

Virginia offers a stable political and regulatory environment, with a long-standing and bipartisan commitment to business

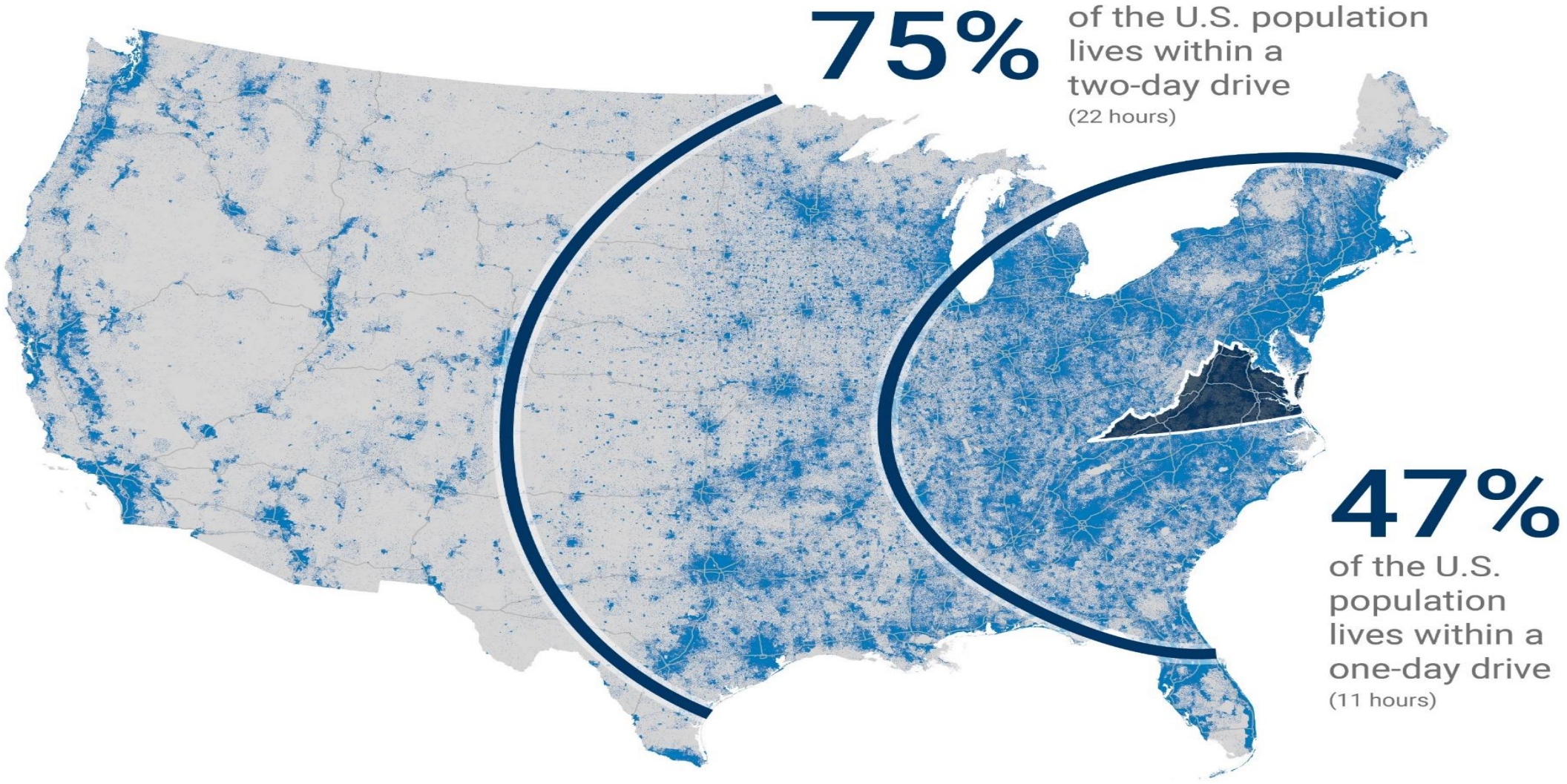
AAA
rating for the past 80 years

47 years
without changes to its corporate income tax rate

VEDP
is your non-partisan partner

#1
most competitive state EDO in the country[1]

VIRGINIA IS STRATEGICALLY LOCATED FOR YOUR SUCCESS



Source: VEDP, Esri Business Analyst

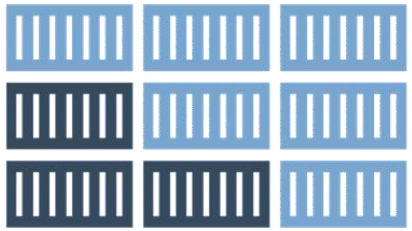
THE PORT OF VIRGINIA OFFERS WORLD CLASS FACILITIES TO MOVE PRODUCTS IN DOMESTIC AND FOREIGN MARKETS

18 nautical miles to open sea and no aerial obstructions

Transit time from Hong Kong **26 Days** via Panama Canal **27 Days** via Suez Canal

50ft/15.24m channels and berths with **Congressional authorization** for 55ft/16.76m deep channels

2 Class I railroads operating on-dock (NS + CSX) provide **two-day double-stack rail** to and from Midwest markets



35 percent of cargo arrives and departs the port by rail, the largest percentage of any U.S. East Coast port

Virginia has the **third largest state-maintained transportation network,** including Interstate routes I-95, I-81, I-64, I-85, I-77 and I-66

Source: The Port of Virginia

VIRGINIA'S PREMIER TALENT BASE PROVIDES A WORLD-CLASS WORKFORCE POOL READY TO MEET BUSINESS NEEDS

- Population of 8.4 million with a workforce of nearly 4.2 million
- One of the lowest unionization rates in the private sector (2.7%)
- Ranked 3rd in the Highest Concentration of Tech Workers as reported in Cyberstates (2018)
- 23,000 doctoral scientists or engineers are employed in Virginia
- 4th largest veteran workforce in the country, adding a skilled, disciplined supply of potential recruits to meet your needs
- #3 labor supply in the U.S. as reported by *Forbes*, Best States for Business 2018


Morgan Olson, Pittsylvania County

VIRGINIA’S INCENTIVES

Morgan Olson, Pittsylvania County

COMMONWEALTH'S OPPORTUNITY FUND (COF)

The Commonwealth's Opportunity Fund (COF) provides "deal-closing" funds at the Governor's discretion to secure a company location or expansion in Virginia.

The program offers a cash grant to offset/reimburse qualifying project-related costs, such as site acquisition and development, transportation access, utility extension or capacity development, construction or build-out of buildings, or training.

A grant is awarded to a local government on behalf of the company. The local government is required to enter into a performance agreement with the company before it may receive the grant award.

Highlights and Eligibility

- ☑ Project must be affiliated with a basic employer, meaning 51% or more of the facility's revenue must be generated outside the Commonwealth
- ☑ Project must be an active and realistic competition between Virginia and another state or country
- ☑ Matching local financial participation is required on a dollar-for-dollar basis
- ☑ Each project must meet thresholds for capital investment and job creation (dependent on locality)
- ☑ Non-Distressed Community: 50 jobs/$5M investment; Single-Distressed Community: 25 jobs/$2.5M investment; Double-Distressed Community: 15 jobs/$1.5M investment. Salary thresholds dependent upon locality's prevailing average wage

For full eligibility and details, visit VEDP.org/incentives.

Appian,

VEDP

VIRGINIA TALENT ACCELERATOR PROGRAM

The Virginia Talent Accelerator Program (VTAP), delivered by VEDP in partnership with the Virginia Community College System, provides world-class training and recruitment solutions that are fully customized to a company's unique operations, equipment, standards, and culture. The program accelerates facility start-ups and expansions by expediting recruiting and shortening the new-hire learning curve. Program benefits are delivered as customized services provided at no charge to eligible companies as an incentive for job creation.

Highlights and Eligibility

The highly customized job-specific training services are delivered using methodologies and media determined to be most effective for accelerating learning in each topic. These can include:

- ☑ Hands-on training
- ☑ Simulations
- ☑ Broadcast-quality videos
- ☑ Illustrated work instructions
- ☑ Instructor-led classroom sessions
- ☑ Animations
- ☑ E-learning modules

For full eligibility and details, visit VEDP.org/incentives.

HOW CAN VEDP HELP YOU?

Team Leader to facilitate business investment in the Commonwealth

Single Point of Contact Between Agencies
Coordinate and introduce appropriate public & private resource providers

Customized Research
Labor availability, Local suppliers, Cost Analysis, etc.

Workforce Solutions
Administer inhouse workforce programs
Facilitate resource provider introduction

Tailored Site Selectin Assistance
Research suitable land and buildings
Coordinate and lead site visits to Virginia

Incentives
Determine qualification for numerous discretionary and by-right incentives

THANK YOU

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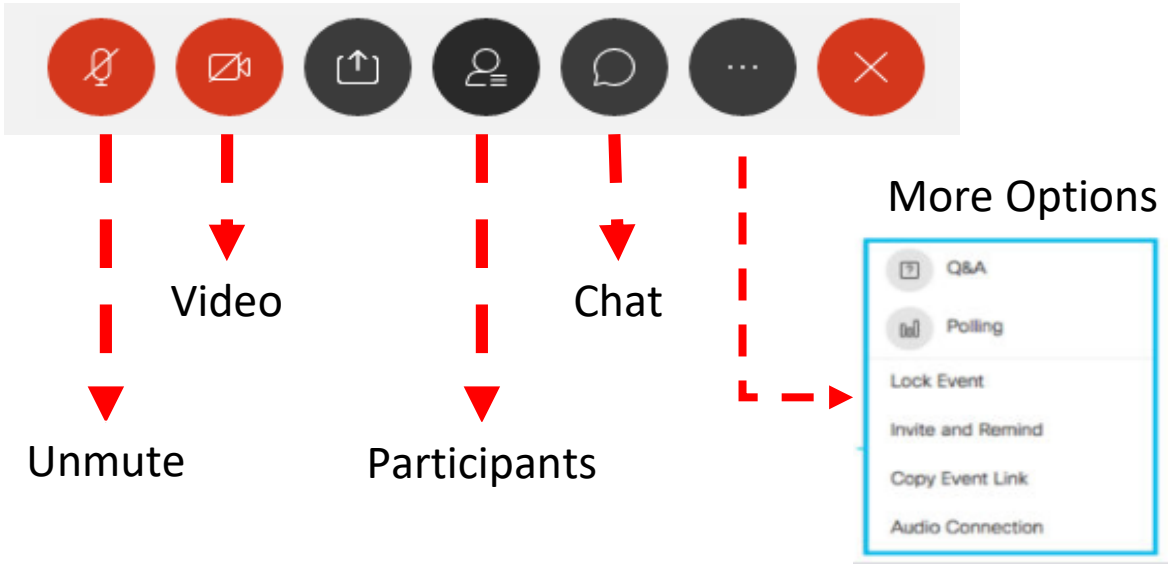
VEDP | Virginia Economic Development Partnership
VEDP.org

AUDIENCE Q&A

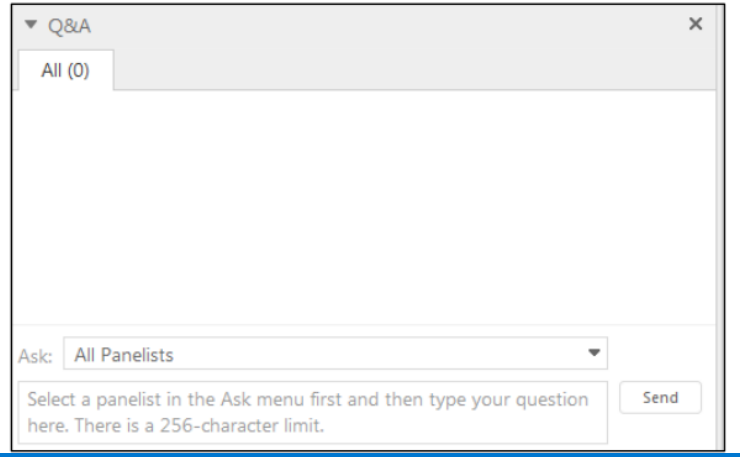
Please type your question
in the Q&A panel.

SUBMIT QUESTIONS IN Q&A ON RIGHT PANEL

Navigation radials at the bottom of your WebEx Screen:



Q&A Panel on the right:



THANK YOU TO OUR PARTNERS

STRATEGEN CONSULTING

ESA Energy Storage Association

Thompson McMullan P.C. A PROFESSIONAL CORPORATION

EAST POINT ENERGY

VIRGINIA ADVANCED ENERGY ECONOMY

VEDP Virginia Economic Development Partnership

SCC Commonwealth of Virginia State Corporation Commission

DMME Virginia Department of Mines Minerals and Energy

CLEAN ENERGY VIRGINIA

Thank you for attending

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